

PATENT SPECIFICATION



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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements in or relating to Motor Vehicle Seat Constructions

We, FORD MOTOR COMPANY LIMITED, a Company incorporated under the laws of Great Britain, of 88 Regent Street, London, W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to motor vehicle seat constructions comprising a seat back swingable from a substantially vertical limit position into a substantially horizontal limit position and *vice versa*, and it is particularly suitable for the upholstered seats of station wagons.

To attain a maximum load area with station wagons the upholstered rear seats are forwardly hingeable so that the rear surface of the seat back forms an extension of the load area to the front seats. This hinging is, with certain vehicle types, rather difficult as certain dimensions are fixed. In vertical direction, for example, the seat back together with the seat is at the bottom limited by the vehicle floor plate and at the top by the vehicle roof. In the longitudinal direction of the vehicle the metal plate for protecting the support of the elements of the rear axle drive forms the rear limitation and the front seats form the front limitation. It is sought to extend the load area as far to the front as possible and to obtain an uninterrupted transition from the rear of the seat to the load area when folding the rear seat. A swinging of the rear seat back around one pivot only is in most cases insufficient as the bottom edge of the rear seat back abuts against the said metal plate. If the extension of the seat back were shortened towards the bottom in order to avoid this disadvantage, a gap would be formed when the seat is swung round between the rear intermediate bottom,

which forms the load area, and the reverted seat back.

It is an object of the invention to provide a hinge arrangement which makes it possible to move the seat back so that it can be freely swung and in its horizontal limit position leaves at most a very small gap between the seat back bottom edge and the front edge of the intermediate bottom which forms the loading area. The bottom edge of the seat back has for this purpose a substantially linear direction of motion.

According to the invention, the hinge comprises two parts, namely a swinging member and a guide, the swinging member being provided with two projections each supported by one end in a single slot formed in the guide and which become successively effective as rotation axes so that the back in a first range of swing is turnable around the one rotation axis and in a further range of swing around the other rotation axis, whereby the lowest point of the back is movable in a substantially linear direction.

According to one embodiment of the invention, the hinge consists of two opposed plates spaced a short distance apart, one of said plates being connected as a swinging member with the side wall of the seat back and the other as guide with the vehicle body. The swinging member is provided with two spaced fixed bolts engaging into a slot disposed on the guide. The slot is V-shaped and so disposed that in each limit position of the seat back one bolt is supported against the end of one side of the slot and thus forms the first axis of rotation, and the other bolt is disposed in the apex of the V-shaped slot and is guided in the other side of the slot in swinging direction until it abuts the end of the slot and on further swinging of the seat back

forms the second axis, the first bolt being slid in its proper slot side to the apex of the V-shaped slot.

Details of the invention are shown in the following description of one preferred example of the invention with reference to the accompanying drawings, wherein:—

Figure 1 is a side view on a left hand hinge on the line I-I of figure 2 with the vehicle body omitted.

Figure 2 is a section on line II-II of figure 1 with a part of the seat back and the vehicle body.

Figure 3 shows the substantially vertical limit position of the seat back.

Figure 4 shows an intermediate position of the seat back after the first swinging period and before the second swinging.

Figure 5 shows the seat back in the horizontal limit position.

In the drawing 1 denotes a floor plate with a protecting plate 2 for the support of the elements of the rear axle drive (not shown). The front seat is shown at 3 and 4. The rear seat 6 with its seat back 7 is disposed forward of the protection plate 2 and the intermediate bottom 5 forming the loading surface. The seat back closely abuts against the front edge 8 of the intermediate bottom whereas the bottom edge 9 is adjacent the protection plate 2.

The turning of the rear seat back 7 is effected by means of a hinge 10 disposed on each side of the back, the hinge consisting of a fitting plate 11 serving as swinging member and of a base plate 12 serving as guide. The swinging member 11 is fixed on the bottom end of the seat back side wall 7 and the guide 12 is fixed on the body wall 13 opposite the swinging member. The swinging member is provided with two projections 14 and 15 in the form, for instance, of bolts or trunnions, which engage into a V-shaped guide slot 16 and are guided slidingly therein. The sides 17 and 18 of the guide slot are spread in the direction of the forward swinging motion of the seat back, the side 17 being on a nearly horizontal arc, which with a radius R corresponding to the distance between the bolts 14 and 15 are drawn around the ends of the sides 18 and 17. The bolt 14 thereby in the vertical limit position of the seat back (fig. 1 and 3) lies in the extreme end of the side 17 and the bolt 15 nearly in the intersection of the two sides forming the apex of the V-shaped slot.

To swing the seat back 7, the seat 6 is in the conventional manner folded against the back 3 of the front seat 4. When the seat back 7 is then swung in the direction of arrow S (fig. 1 and 3), a swinging occurs without a sliding motion of the bolt 14 in the slot side 17 of the guide 12. The bolt

14 remains in its position and serves as rotation axis whereas the bolt 15 slides along the side 18 upwards until it abuts against the end of the side and takes position 15'. The seat back 7 is now in the intermediate position shown in figure 4. The lower edge 9 of the back takes the path 19-20. On further swinging the seat back in the direction of arrow S from the position after figure 4, a swinging occurs which retains the bolt 15 in the position 15' as rotation axis so that the bolt 14 can slide to the right in the slot side 17 until it reaches position 14' in the apex of the V-shaped slot. Simultaneously with the motion of bolt 14 towards 14' the movement of the lower back edge from point 20 to edge 8 of the intermediate bottom forming the loading surface is accomplished. The folding of the seat back is thus terminated and, as evident from figure 5, at most only a small gap is left between the lower edge 9 of the seat back 7 and the front edge 8 of the intermediate bottom 5, which can be brought to any tolerance. The lower edge of the back executes a substantially linear motion along the path 19-20-8, whereby a collision with the protection plate 2 is avoided. On swinging the seat back from the position after figure 5 into the position after figure 1, the bolt 15 in its position 15' serves as rotation axis, and the bolt 14 slides from its position 14' back into its final position after figure 1. In this position it serves as rotation axis, and the bolt 15 slides from its position 15' back to the apex of the V-shaped slot, the lower edge 9 of the back thereby moving along the nearly linear path 8-20-19.

Various modifications may be made within the scope of the invention.

WHAT WE CLAIM IS:—

1. A motor vehicle seat construction in which a seat back is swingable on hinges from a substantially vertical limit position into a horizontal limit position and *vice versa*, in which each hinge comprises two parts, namely a swinging member and a guide, the swinging member being provided with two projections each supported by one end in a single slot formed in the guide, and which become successively effective as rotation axes so that the back in a first range of swing is turnable around the one rotation axis and in a further range of swing around the other rotation axis, whereby the lowest point of the seat back is movable in a substantially linear direction.

2. A seat construction as claimed in claim 1 in which the two parts comprise two opposed slightly spaced plates, the one of them acting as swinging member being connected with the side wall of the seat back, and the other acting as guide being

connected with the vehicle body, the swinging member being provided with two bolts fixed at a certain distance from each other and engaging into the slot disposed on the 5 guide plate.

3. A seat construction as claimed in claim 2 in which the guide slot is generally V-shaped with sides spreading in the direction of the forward swinging motion of 10 the seat back from the substantially vertical position into the horizontal position and the one slot side lies on a substantially vertical arc which is drawn about the outer end of the opposite side with a radius corresponding 15 to the distance between the bolts.

4. A seat construction as claimed in

claim 3 in which, in the limit positions of the seat back, one bolt is supported against the end of the one side of the slot and forms the first rotation axis, and the other bolt is 20 in the apex of the V-shaped slot and on swinging the back is slid in swinging direction in the respective slot side until abutting its end, and on further swinging of the back, forms the second rotation axis, the 25 first bolt being guided in its respective slot side towards the apex of the V-shaped slot.

5. A motor vehicle seat construction substantially as described with reference to the accompanying drawings. 30

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